Abstract of the Disclosure

A system for using machine-learning to create a model for performing integrated circuit layout extraction is disclosed. The system of the present invention has two main phases: model creation and model application. The model creation phase comprises creating one or more extraction models using machine-learning techniques. First, a complex extraction problem is decomposed into smaller simpler extraction problems. Then, each smaller extraction problem is then analyzed to identify a set of physical parameters that fully define the smaller extraction problem. Next, models are created using machine learning techniques for all of the smaller simpler extraction problems. The machine learning is performed by first creating training data sets composed of the identified parameters from typical examples of the smaller extraction problem and the answers to those example extraction problems as solved using a highly accurate physics-based field solver. The system them uses the created training sets to train neural networks that will be used to model the extraction problems. Bayesian inference is used to train the neural networks models. Bayesian inference may be implemented with normal Monte Carlo techniques or Hybrid Monte Carlo techniques. After the creation of a set of models for each of the smaller simpler extraction problems. the machine-learning based models may be used for extraction.